
Q-SUN solar
Share Sunshine Value With The World

CONTENTS

Q-SUN solar

Annual Capacity	Production Bases	Covered Countries
4GW	2	50+

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ABOUT US

Q-SUN solar as an international enterprise, focus on the R&D production and sales of PV modules. Located in Nanjing with two production bases in Tianchang and Yancheng moreover an oversea branch in Germany.

Q-SUN solar an international enterprise, focusing on the R&D,production and sales of PV modules.

Q-SUN solar achieves the leading level in the field of intelligent production and manufacturing of photovoltaic modules. Founded in 2014, Q-SUN solar is located in Nanjing with another 2 production centers in Tianchang and Yancheng.

Over a decade development, Q-SUN solar provides more than 4GW high-efficiency photovoltaic modules per year to nearly one million users in 50+ countries and regions around the world, creating a continuous flow of electricity and financial benefits for global users.

Enterprise footprint

2014
Q-SUN solar founded

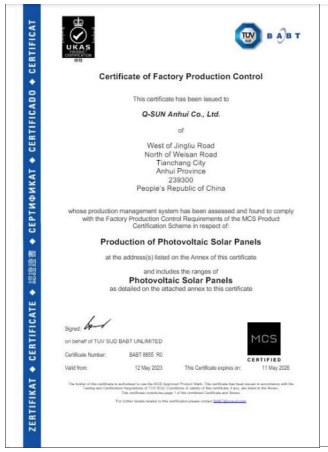
2017
ANHUI production base founded

2018
Exported to 30+ countries

2021
NanJing marketing center founded

2022
Dongtai production base founded

2023
Germany Branch founded


Certificate of Factory Production Control

Q-SUN Anhui Co., Ltd.

West of Jinglu Road
North of Weisan Road
Tianchang City
Anhui Province
239300
People's Republic of China

Production of Photovoltaic Solar Panels

Photovoltaic Solar Panels


Attestation of Conformity

No. N8A 104991 0002 Rev. 04

Holder of Certificate: Q-SUN Anhui Co., Ltd.

Product: Crystalline Silicon Terrestrial Photovoltaic (PV) Modules
Mono & Poly Crystalline Silicon Photovoltaic Module


CERTIFICATE

No. Z2 104991 0007 Rev. 00

Holder of Certificate: Q-SUN Anhui Co., Ltd.

Certification Mark:

Product: Crystalline Silicon Terrestrial Photovoltaic (PV) Modules
Mono-Crystalline Silicon Photovoltaic Module


CERTIFICATE

No. Z2 104991 0001 Rev. 04

Holder of Certificate: Q-SUN Anhui Co., Ltd.

Certification Mark:

Product: Crystalline Silicon Terrestrial Photovoltaic (PV) Modules
Mono & Poly Crystalline Silicon Photovoltaic Module

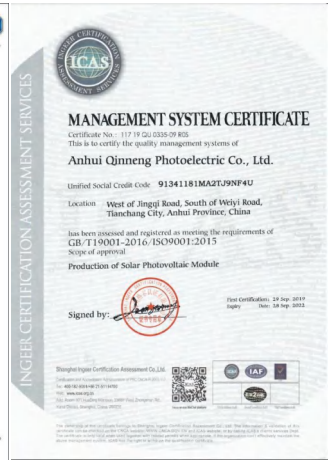

CERTIFICATE

No. Z2 104991 0004 Rev. 00

Holder of Certificate: Q-SUN Anhui Co., Ltd.

Certification Mark:

Product: Crystalline Silicon Terrestrial Photovoltaic (PV) Modules
Mono Crystalline Silicon Photovoltaic Module


MANAGEMENT SYSTEM CERTIFICATE

Certificate No.: 117 19 QU 0335-09 R0S

This is to certify the quality management systems of

Anhui Qinneng Photoelectric Co., Ltd.

Unified Social Credit Code 91341181MA2TJ9NF4U

Location West of Jingqi Road, South of Weiyi Road, Tianchang City, Anhui Province, China

has been assessed and registered as meeting the requirements of GB/T19001-2016/ISO9001:2015

Scope of approval

Production of Solar Photovoltaic Module


太阳能产品认证

试验报告


太阳能产品认证

试验报告


RAPPORTO DI PROVA N. 415220

TEST REPORT No. 415220

pannello fotovoltaico denominato "QN-xxxHD"

classificazione di reazione al fuoco secondo le norme UNI 9177:2008, UNI 9176:2010, UNI 8457:2010 e UNI 9174:2010

CLASSE DI REAZIONE AL FUOCO 1 (uno)


Certificate

Certificate No.: USA21E45738R0M

This is to certify that the Environmental Management System of

Q-SUN ANHUI CO., LTD.

Unified Social Credit Code: 91341181MA2TJ9NF4U

Has been audited to conform to the following Environmental Management System standard

ISO 14001:2015

The Applicable Scope

The production of solar photovoltaic modules and related environmental management activities of involved sites


Certificate

Certificate No.: USA21S25739R0M

This is to certify that the Occupational Health and Safety Management System of

Q-SUN ANHUI CO., LTD.

Unified Social Credit Code: 91341181MA2TJ9NF4U

Has been audited to conform to the following Occupational Health and Safety Management System standard

ISO 45001:2018

The Applicable Scope

The production of solar photovoltaic modules and related occupational health and safety management activities of involved sites


epd-norway

Environmental Product Declaration

In accordance with ISO14025:2006 and EN15804:2012+A2:2019

Photovoltaic modules

435W

Q-SUN Anhui Co., Ltd.

Certificates holding:

TUV, MCS, ECS, CQC
INMETRO, BIS, CEC,
CLASS1, EPD

Certificates to come:
ETL

Our Certificates

High-efficiency and High-flexibility Modular Automatic Production Line

To achieve a high utilization rate and efficiency,Q-SUN solar has divided the entire production chain into separate but closely united automated production sectors.Over 40 patents are applied on the production process optimization,which effectively avoids manual errors and makes sure all the production process from raw material inspection to packing are all monitored online and saved for later use.

At the same time,the production department collects data from various key monitoring points In the production process to achieve further improvement in equipment, manufacturing process and yield.

16%
Lower production cost

16%
Higher equipment effectiveness

24*7
Real-time online monitoring

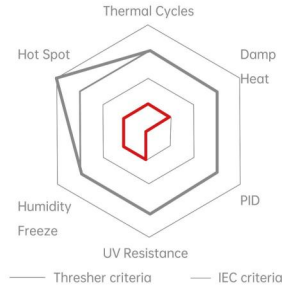
100+
Production process optimization

99.9%
Good product yield rate

36%
Higher production efficiency

Standards IEC61215 And IEC61730

IEC Standards includes a series of tests for thermal cycling, damp heat, PID, UV, humidity freeze and hot spot. It is designed to test whether or not modules can maintain their power output during adverse conditions throughout their lifetime.



Project	Condition	IEC Criteria	Thresher Criteria
Thermal Cycles	-40~80 ℃	200 cycles	**600 cycles**
Damp Heat	85 ℃ 85% RH	1000 h	**3000 h**
PID	——	——	**96 h**
UV Resistance	——	15 kW/m²	**45 kW/m²**
Humidity Freeze	-40 ℃~ 80 ℃ 85% RH	10 cycles	**30 cycles**
Hot Spot	60 kwh/m²	5 h	**20 h**

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CORE ADVANTAGES

Engaged in industry for multiple years, automated production lines with advantages of high stability, high flexibility, and high output.

Excellent product service system

- Stable distribution channels
- High product quality
- ③ Perfect after-sales service and good customer stickiness
- The company’s organizational structure is streamlined which leads quick market response

Leading Technology TOPCon

- N-Silicon TOPCon
- Improved Encapsulating
- Optimized Welding
- Multi-busbar
- Half-cut
- Strengthened Framing

Q-SUN solar Module ---
Excellent power generation

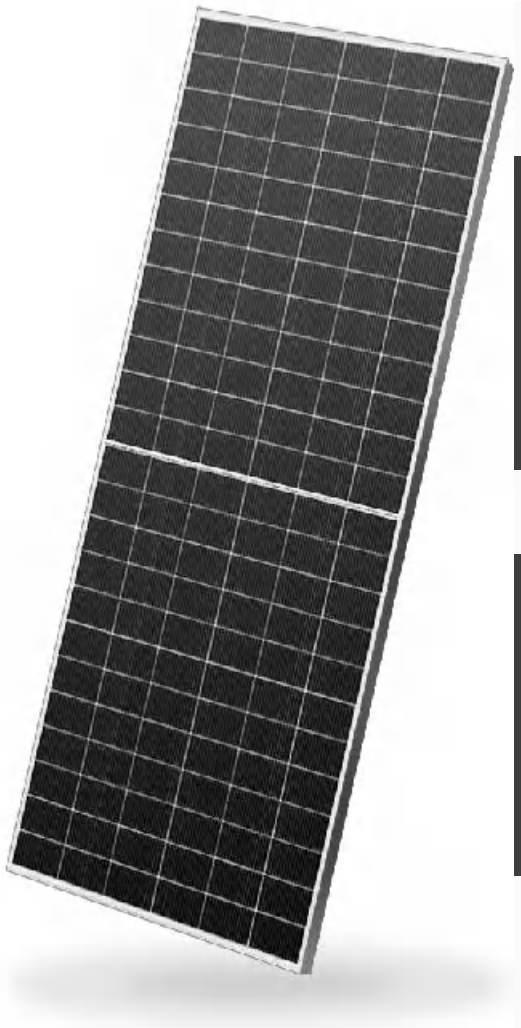
Attenuation characteristics

During the 30-year life cycle, the power generation gain is approximately 1.8%.

The one-year results of the power station show that the module power attenuation in the first year was only 0.15%.

High temperature characteristics

- Module temperature coefficient: -0.30%/℃,
- High temperature power loss is 1% lower than p-type module.
- The operating temperature of the module is about 1℃ lower,and the power generation capacity increases by about 1.5%-2%.



Double-sided power gain performance

Double-sided rate is about 80% (p type ~70%)

Combining theory with Pvsyst simulation,

the power generation gain is around 0.8%-1.2%

Low light characteristics

Closely related, when the irradiance is 600W/m2 or below, the power generation gain of n-type module is about 0.2%.

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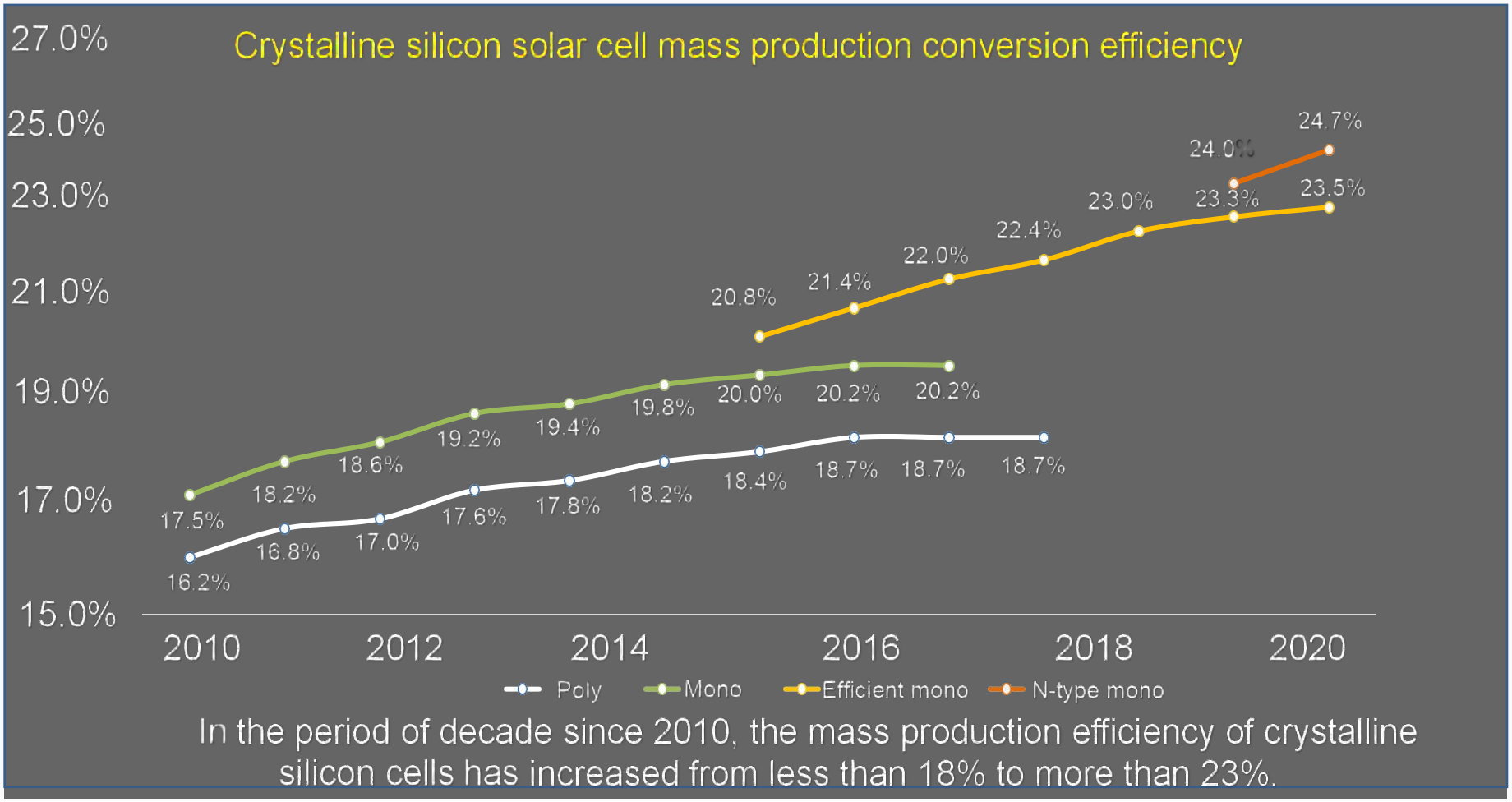
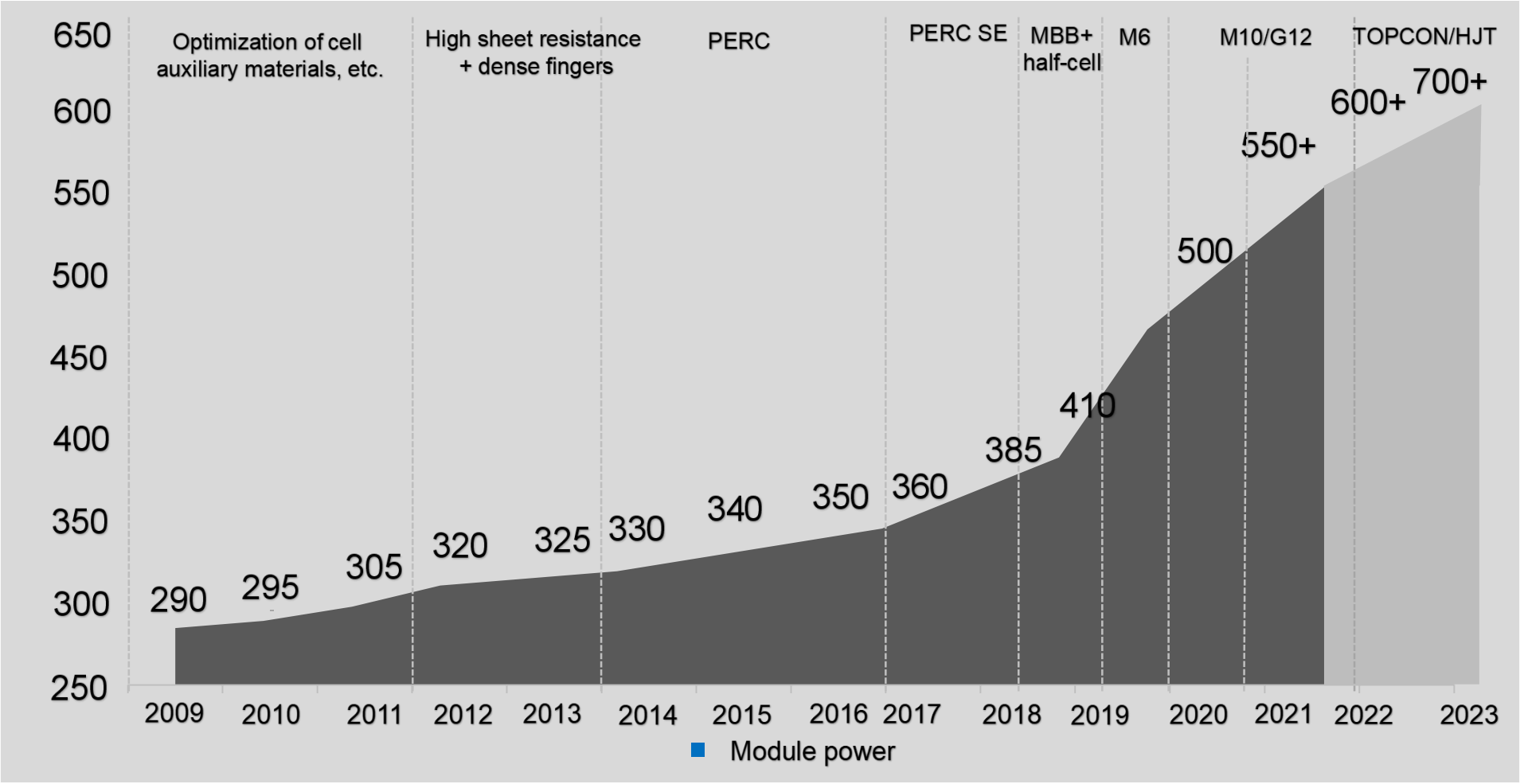
PRODUCTS AND SERVICES

Follow clients'need, keep upgrading optimization, provide product operation, maintenance and after-sales guaranteed.

PV industry develops rapidly and the efficiency of crystalline silicon cells keeps improving



PV module efficiency improve road map



Development trends of high-efficiency PV modules

Silicon wafer Sizes are upgrading

2010-2017

- 125mm/156mm
- 156mm/156.75mm（M0 M1 M2）

2018-2019

- 158.75mm/166mm（G1 M6）

2019-2021

- 210/182mm（G12 M10）

2022-

- 182*210/18*199（182+x）

Cell Efficiency is improving

- P-type→N-type 17%-25.3%

BSF-PERC-TOPCON- HJT

- Monofacial→Bifacial

Numbers of busbar added

XBB-MBB-SMBB

- SE,etc.
- ……

Module Power is increasing

Optimization of auxiliary materials

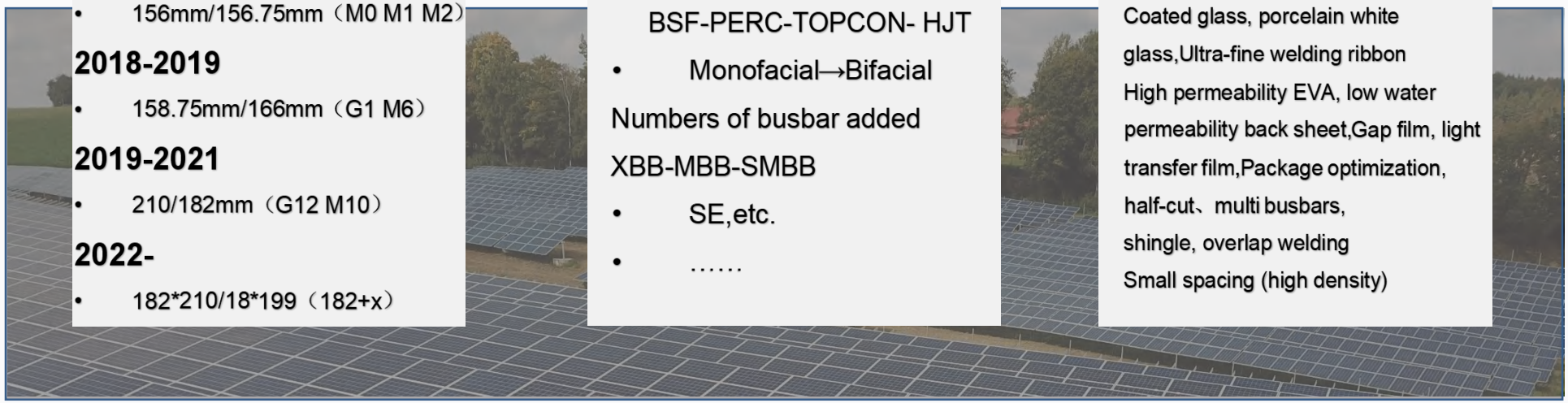
Coated glass, porcelain white glass,Ultra-fine welding ribbon

High permeability EVA, low water permeability back sheet,Gap film, light transfer film,Package optimization,

half-cut、multi busbars,

shingle, overlap welding

Small spacing (high density)



Q-SUN solar module core-tech ---
Bycium+cell technology

Front surface SMBB

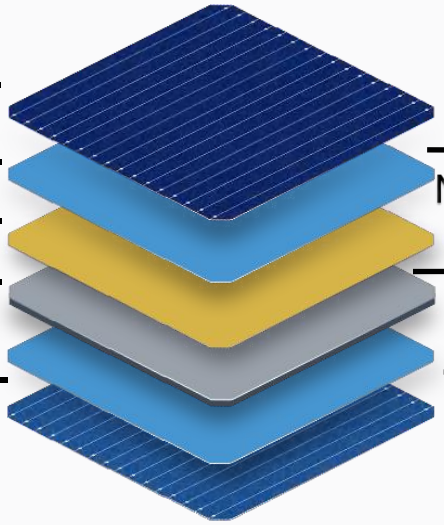
Front surface passivation FSP

Selective emitter SE

N substrate

Back surface passivation+
Passivated contact

Back surface SMBB



Front surface passivation

N type low oxygen silicon wafer
Millisecond lifespan

Back surface
interface composite

Double-sided anti-
reflection film + thin fingers

25.3%

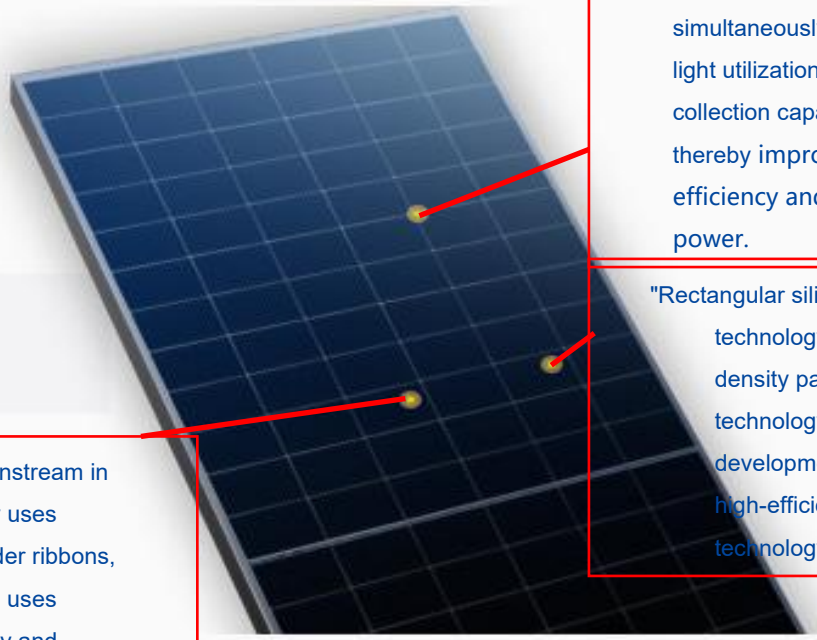
Mass product efficiency

VOC

725mv

Q-SUN solar module core-tech --- Bycium+cell technology

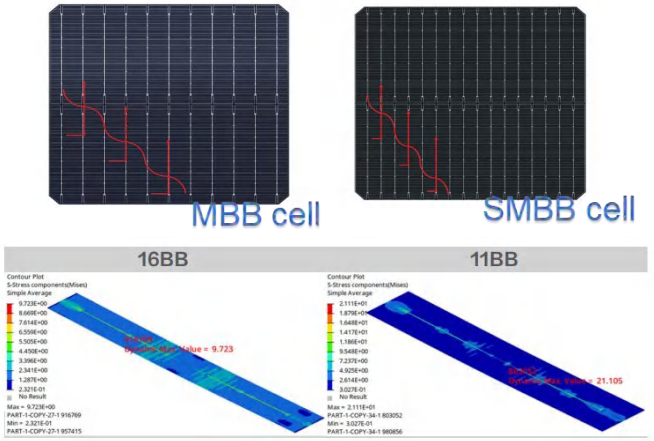
SMBB(Super Muti-busbar) SMBB technology is an upgrade of MBB technology, with more and thinner busbar lines, giving full play to the technical advantages of multi-busbar, effectively shortening the current transmission path, reducing series resistance, and improving cell efficiency. Moreover, the increase in the number of welding points of the welding ribbons and main grid lines will make the stress distribution more uniform, which can improve the cell's tolerance to broken grids and hidden cracks, thereby improving reliability.



(SMBB) technology simultaneously improves light utilization and current collection capabilities, thereby improving cell efficiency and module power.

"Rectangular silicon wafer technology" + "high-density packaging technology" is the development trend of high-efficiency module technology application

The mainstream in the industry uses circular solder ribbons, and Q-SUN uses efficiency and welding reliability, half-cell modules adopt ≥16 busbars

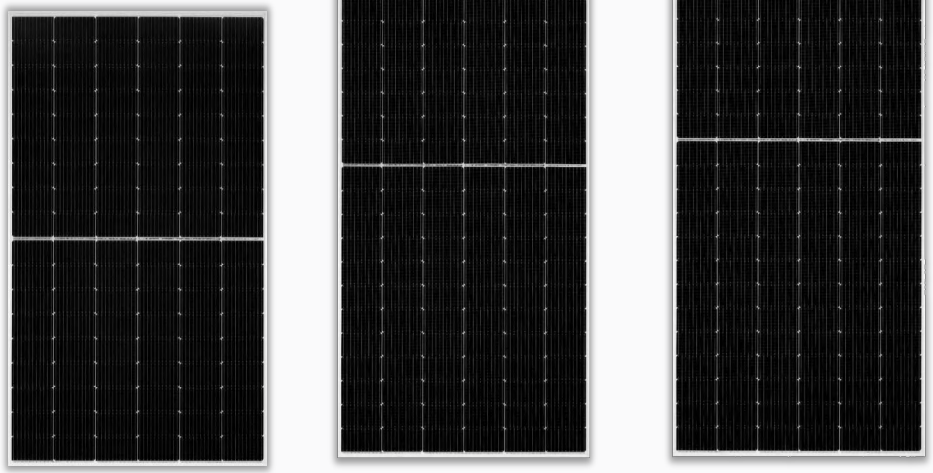


Comparison of simulated stress clouds of 16BB cell and 11BB cell

（The stress analysis model is to analyze a part of a complete module. The applied load on the module reaches a bending displacement of 0.5mm. The interception range is: the length is one busbar of the cell, and the width is the same busbar spacing.）

According to the simulation results, the stress range of 16BB cell is 0.23-9.72 MPa, and the stress range of 11BB cell is 0.30-21.11 MPa. Therefore, the stress range of 16BB is smaller and the stress distribution is more uniform.

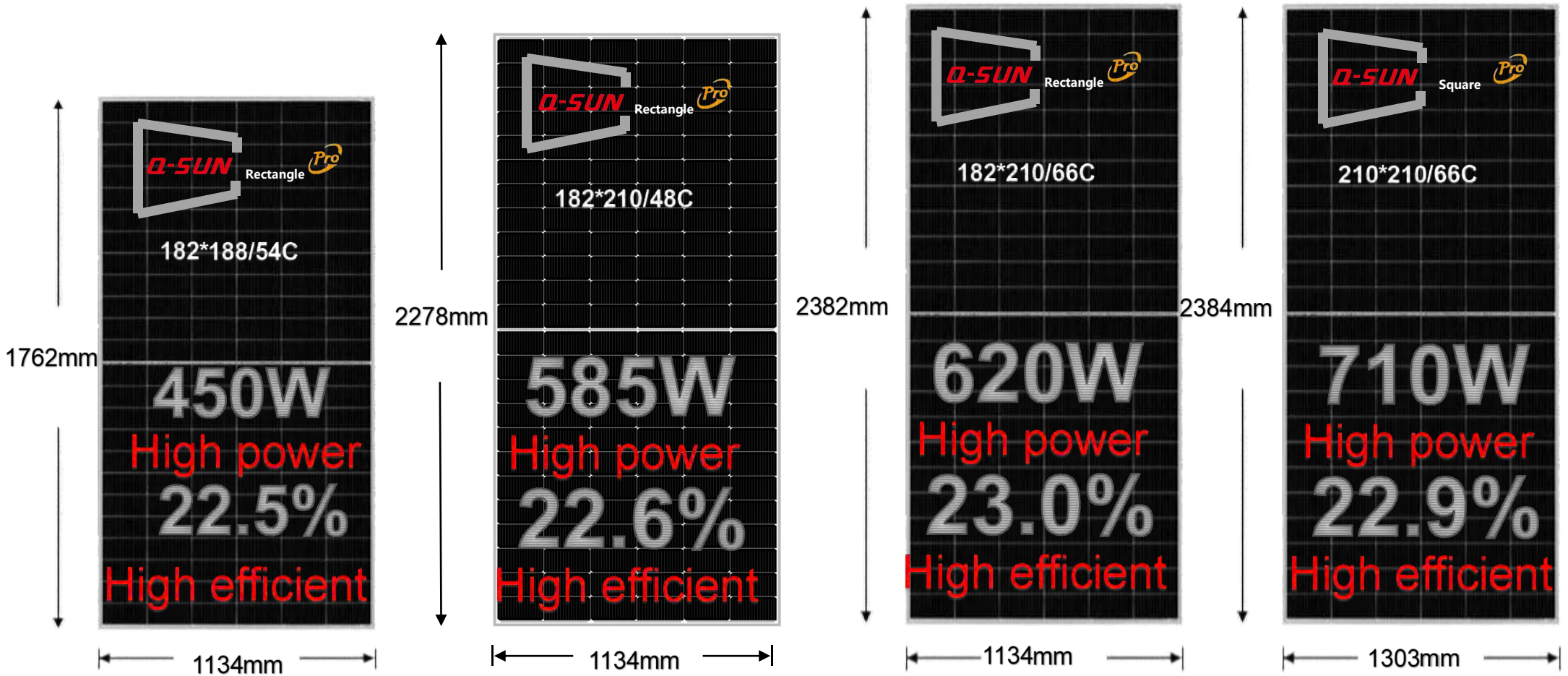
Q-SUN solar New generation of efficient n-type module



Q-SUN Rectangle Pro

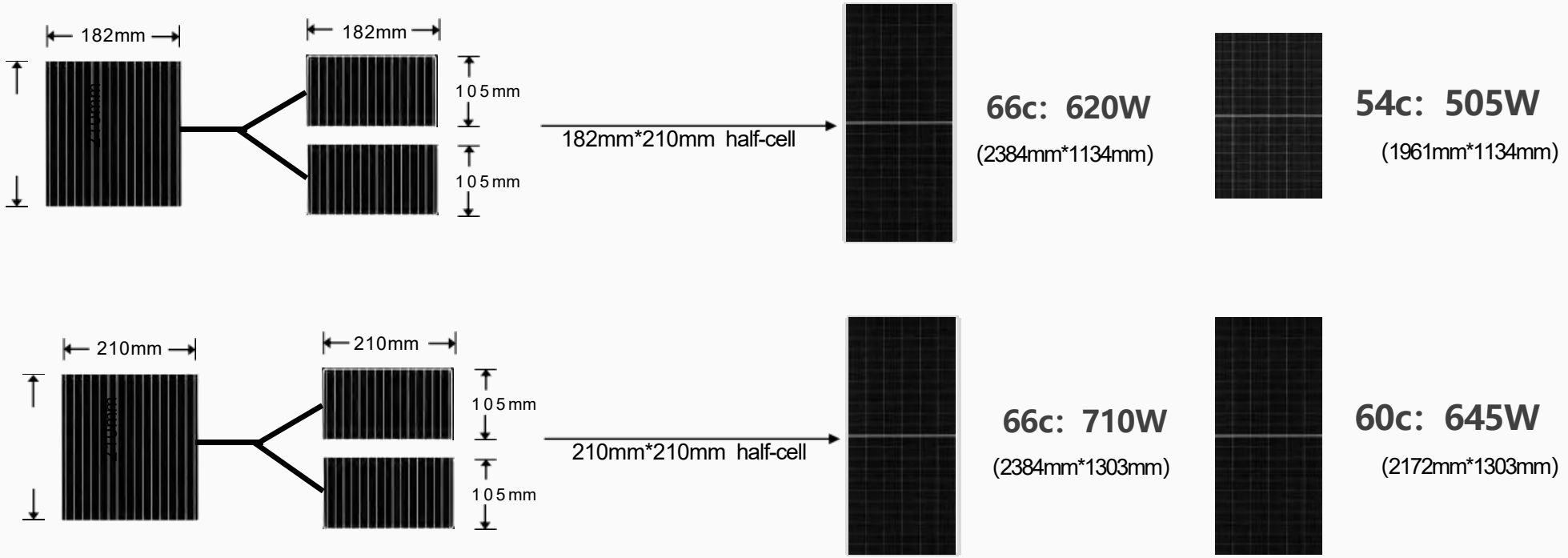
Q-SUN solar,Share the value of sunshine with the world

Q-SUN solar Rectangle PRO



Q-SUN solar module core-tech---Based on more inclusive rectangular silicon wafers

New generation rectangular & square wafer size182mm*210mm&210mm*210mm



Q-SUN solar module---Different version designs meet different scenarios

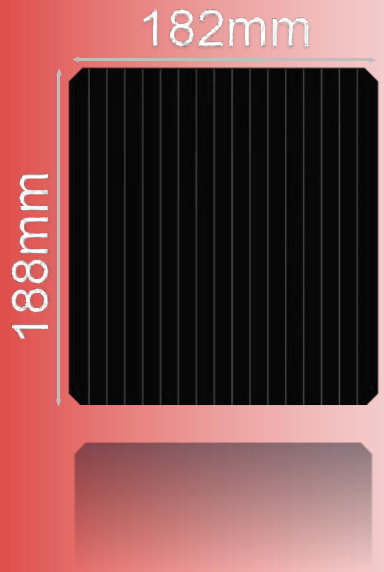
182mm*188mm&186.8mm

1 type silicon wafer

1 types of version

Q-SUN Square Pro

188 Rectangular Series



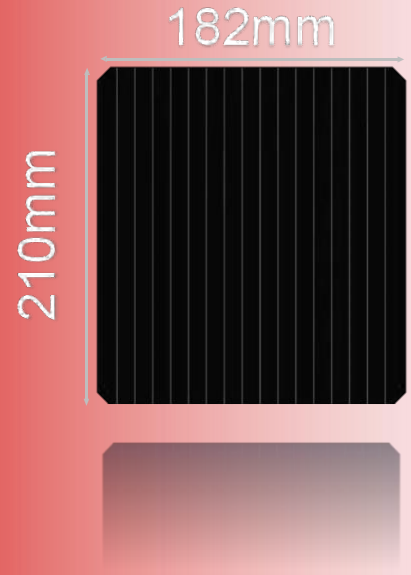
1762*1134mm

Residential power station

Q-SUN solar module---Different version designs meet different scenarios

182mm*210mm

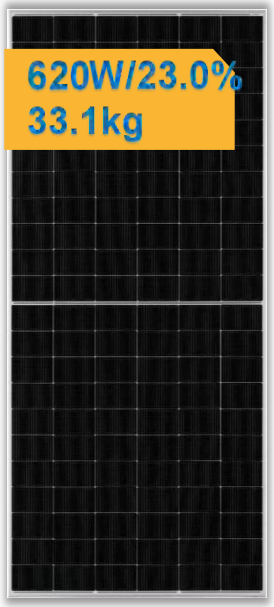
1 type silicon wafer 2 types of version



Q-SUN Rectangle Pro

210 Square series

1762*1134mm



2382*1134mm

Residential station

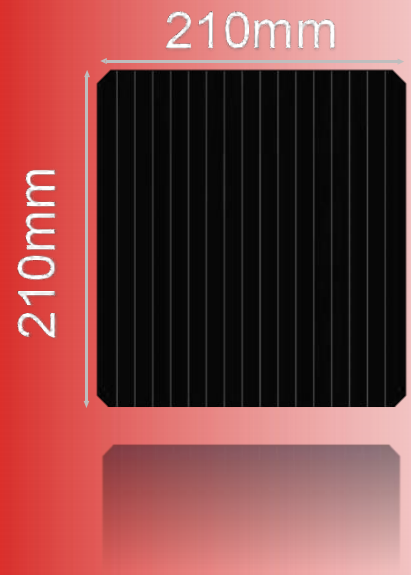
Industrial and commercial, utility power stations

Q-SUN solar module---Different version designs meet different scenarios

210mm*210mm

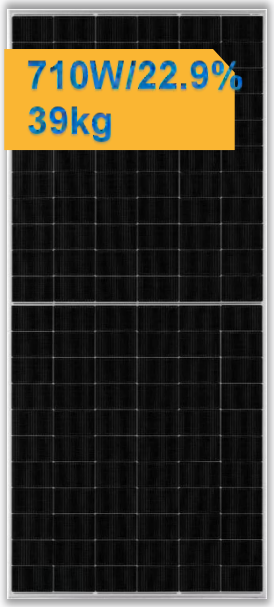
1 type silicon wafer

1 types of version



Q-SUN Square Pro

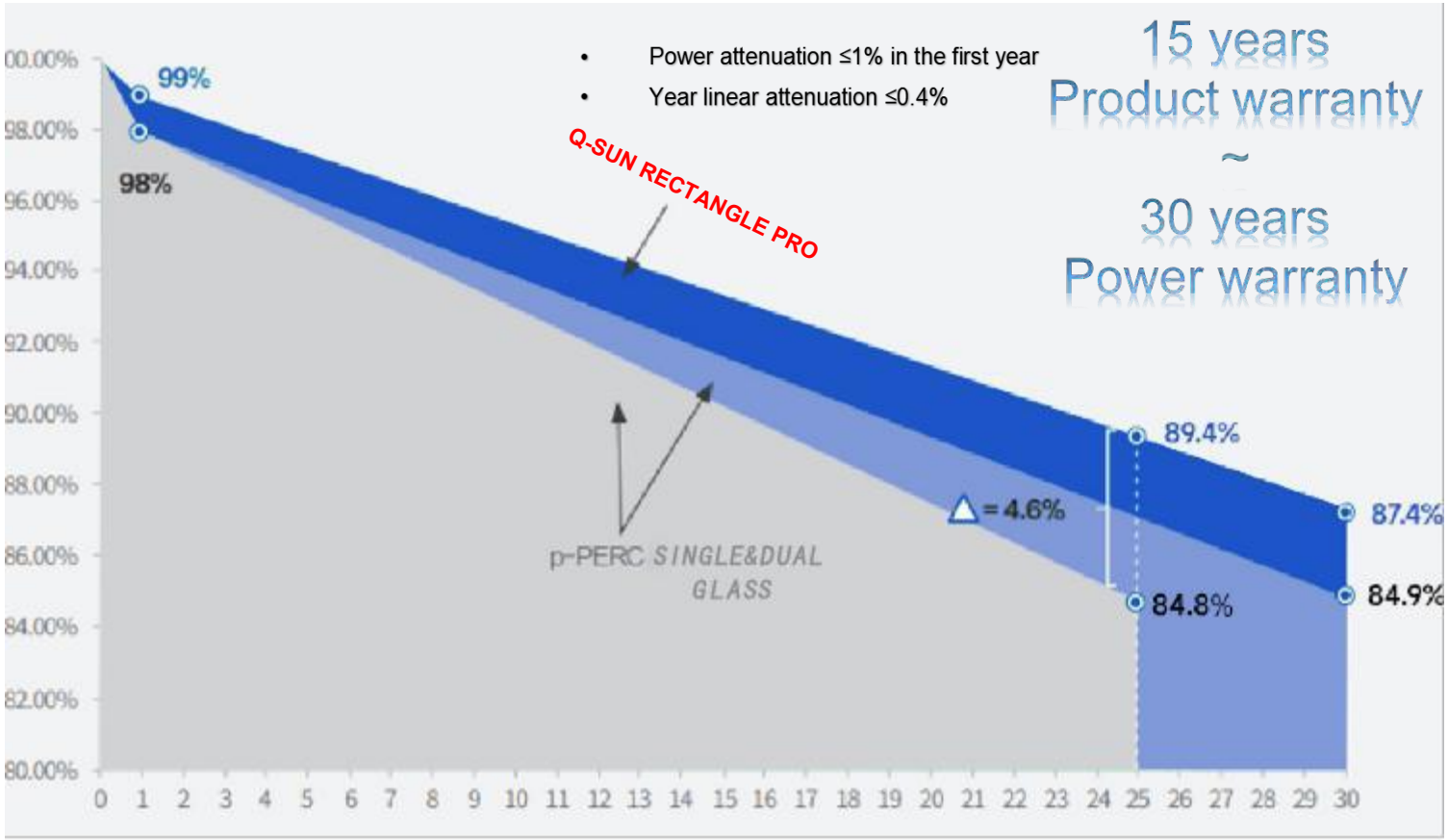
210 Square series



2384*1303mm

Industrial and commercial, utility power stations

Q-SUN solar Rectangle PRO --- Extra long warranty



Leading product and power warranty

The ultra-long warranty is due to the excellent characteristics of the product itself and Q-SUN solar's strict quality and reliability assurance system.Q-SUN solar Rectangle pro all series products come with industry-leading comprehensive warranties:

15-year product warranty and 30-year power warranty（**especially offers about 450W products for european union assigned 25-year warranty**）; and the power attenuation in the first year is ≤ 1%, the linear power attenuation is ≤ 0.4% annually. Ensure that photovoltaic power stations using Q-SUN solar Rectangle pro have better power generation performance throughout the power station life cycle,can generate more clean electricity to help the world's green, low-carbon and sustainable development.

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KEY CLIENTS

Q-SUN solar provides more than 4GW high-efficiency photovoltaic modules per year to nearly onemillion users in 50+ countries and regions around the world

Q-SUN solar project case

Anhui Jiaokong Group 8MW highway PV project

Anhui Yingfa Group 6MW project

Cheng qing3.2MW project

Nanjing Ningshun 2MW project

Project case













Business Coverage

THANKS

Q-SUN SOLAR

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www.q-sunsolar.com